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Inventor(s): John N. Gross, Anthony A. Gross

Title: *Word Checking Tool for Word Processing Applications*

Enclosed are:

[x]   _32_ pages of written description, claims and abstract.

      _3_ sheets of formal drawings.

[ ]   A certified copy of a _____ application.

[x]   A declaration and power of attorney.

[x]   A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.

[ ]   Applicant(s) claim convention priority under 35 U.S.C. 119 based on _____ application
      Serial No. _____ filed _____.

[ ]   An information disclosure statement

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John N. Gross, Attorney at Law • 10950 N. Blaney Suite B • Cupertino, CA 95014 • (408)-342-1862 Application Transmittal

Word Checking Tool for Word Processing Applications

FIELD OF THE INVENTION

      The present invention relates to authoring tools that can be used in connection with contemporary word processing programs. In particular, the present invention provides an author

5   of an electronically drafted document with a word checker that checks for and identifies inappropriate word choices in such document based on a sensitivity scheme of the user's choosing so that such words may be modified if necessary.

BACKGROUND OF THE INVENTION

      The prior art is replete with word processing programs, including a couple of

10   contemporary favorites, Microsoft WORD and Novell's Wordperfect, that are used by a substantial portion of IBM-compatible computer users. These programs are used in known ways for permitting authors to create electronic text (and graphics) documents. As a part of such word processing program, a spell-checking routine is almost always included to help authors reduce the number of unintentional text errors in such documents. A number of prior art patents are

15   directed to this feature, and a reasonable background of the same is described in U.S. Patent Nos. 5,604,897 to Travis and 5,649,222 to Mogilevsky, both of which are hereby incorporated by reference.

      It is apparent, however, that spell-checking routines associated with such word processing programs have a number of limitations. Key among these is the fact that they cannot determine

20   whether a particular word choice, while accurately spelled, is nevertheless perhaps inappropriate for the particular context within a particular document. As an example, many words that may be intended by a drafter (such as the words "ask," "suit," "public," etc.) can be transformed into potentially offensive words merely by changing a single letter in such words, transposing a few letters, or by mistakenly adding or dropping a letter. These transformed words, however, will

25   still pass the spell-checking facility, because many of them include even a number of offensive words as part of their standard dictionary. For example, the word "ask" may be inadvertently written as "ass," and unless the message is intended to discuss issues pertaining to certain members of the animal kingdom, it is likely to be an inappropriate word choice. If these inadvertent mistakes are not caught by the drafter during a later review, they will be included in

such document and potentially communicated to one or more third parties. Depending on the severity of the mistake, the receiving audience, and the scope of the distribution of the document, the consequences may range from minor embarrassment to substantial financial loss from lost future business with such third party.

5   The possibility of such errors is increasing each day because of a number of driving factors, including the fact that standard dictionaries for word processors are growing in size to accommodate the largest number of words of course in a particular language. While one solution may be to not include such words in an electronic dictionary in the first place, this result makes the creation of such dictionaries more complicated because an initial censoring must be done

10   before the words are even translated into electronic form. Moreover, this solution does not help the user to identify inappropriate words that may be skipped over during a spell-checking routine.

       Another factor leading to increase in electronic word choice errors is the fact that many electronic documents are never reduced to a physical form before being disseminated. In many

15   instances a glaring error is caught by a human inspection of a printed page before it is sent out. The so-called "paperless office" while improving efficiency and reducing waste also naturally causes a larger number of inadvertent message errors in text documents. Additional errors can even be induced by spell-checkers because when they detect a mis-spelled word, they will often provide a menu of potential word choices as replacements, and it is remarkably easy to select an

20   inappropriate word choice from such menu, again merely by accident. Such errors of course will not be detected because the document is erroneously considered to be "safe" by many users after spell-checking has completed and they will not check it again. In other words, some facility for checking the spell-checker dynamically is also desirable, but does not exist at this time.

       There is some facility in the prior art for permitting users to create so-called "exclusion"

25   dictionaries for analyzing text documents. An example of such kind of system is illustrated in U.S. Patent No. 5,437,036 to <u>Stamps et. al.</u> which is incorporated by reference herein. A drawback of this approach, however, lies in the fact that it requires the user to both divine and manually input all the potential mis-spellings that could occur, and even if they had the time, there are obviously an endless variety that might never be considered by such user. For example,

a user may not have the foresight to notice that a simple transposing of two characters (a common error) may generate a word that is extremely offensive. Furthermore <u>Stamps et. al.</u> do not appear to contemplate the possibility that the act of rendering a document "spelling" error free may itself generate unintended word selection errors. As such, therefore, <u>Stamps et. al.</u> is

5   not truly a "word" checker, but, rather, an enhanced spell checker that has been sensitized to a particular user's poor spelling habits. While it incidentally determines whether a word is perhaps not the intended choice of the author (i.e., that the word does not have a *particular* meaning), it does not perform the important step of determining the *precise* meaning of the word, and in particular whether the word also has a potentially inappropriate meaning as well.

10   A few methods for proof-reading electronic documents are also known in the art. A U.S. Patent 4,674,065 to <u>Lange et. al.</u>, also incorporated by reference herein, describes a technique for detecting word context errors in a document. This technique seems limited to homophones however (for example, it knows to see if a user intended to use the word "course" instead of "coarse") and is not generally applicable to the problem of determining inappropriate use of

15   language in documents. For example, unless a particularly offensive word has a homonym, <u>Lange et. al.</u> would not even detect such word as being a problem. The approach of <u>Lange et. al.</u> further requires a fair amount of computational complexity, since it must analyze the text preceeding and following after a word and use a complicates set of syntax rules to determine whether the word is being used in context correctly. This fact alone makes it essentially

20   unusable for most contemporary word processing programs which utilize background spell checking, dynamic spell-checking, etc.

Finally, a U.S. patent by 4,456,973 to <u>Cargren et al.</u>, and also incorporated by reference herein, discusses the use of an electronic word dictionary that has an associated code field for indicating the level of comprehensibility of such word. For example, the word "abandon" is

25   coded with a numerical designation 6, indicating that the word is probably understandable by children at the 6th grade level. <u>Cargren et al.</u>, however, do not appear to address the more general problem of identifying text that has been inadvertently mis-spelled by an author, and which is likely to be inappropriate. In other words, the <u>Cargren al.</u> approach presumes that the user has correctly input the word in question, and unless the word is coded with a rating below that of the

intended grade group of children, it is not flagged in anyway. It is apparent that this method of encoding is fairly impractical for use in an electronic dictionary intended to be used by an adult population, because adults are not classified in this way. In fact, if a target audience of a document is intended to be primarily adults, then the Carlgren et al. approach would not flag any words at all, because they would probably be presumed to be operating at the highest level of education (12), thus rendering this type of filtering essentially useless. In addition, there is no facility mentioned by Cargren et al. for detecting words that are likely to be offensive, even if consciously selected by the author. For example, the use of the word "dame" may be consciously selected but nevertheless undesirable in communications in which the intended audience is primarily adult women. A drafter of an electronic document may desire to be notified of such potentially offensive words if they are known to be sensitive.

SUMMARY OF THE INVENTION

An object of the present invention therefore is to reduce the number of unintentional inappropriate word choices within electronic documents that would otherwise go unnoticed using conventional word processing document checking tools so as to improve the integrity and accuracy of such documents;

Another object of the present invention is to provide a system and method that is easily and seamlessly integratable into conventional word processing document checking tools so as to enhance the performance of such tools;

A related object of the present invention is to provide a system and method for filtering and verifying the contents of one or more electronic documents to determine the presence of potentially inappropriate and unintended word choices;

Yet a further object of the present invention is to reduce the number of intentional but unknowingly inappropriate word choices within electronic documents that would otherwise go unnoticed using conventional word processing document checking tools;

A related object is to improve the performance of present day word processing document checking tools by providing an additional verification tool that confirms the appropriateness of the selections made by such prior art checking tools;

Another object of the present invention is to permit a user of a word processing program to selectively control the level of sensitivity to be used for determining whether words in an electronic document are potentially inappropriate;

Still another object of the present invention is to permit an author of an electronic document to have the words of such document analyzed and processed by a number of context filters of the author's choosing to reduce the number of potential inappropriate words in such document.

These and other objects are achieved by the present invention which includes a word checking software routine (implementable as a stand-alone program or integrated with a conventional spell checker) that checks the meaning of words in an electronic document authored by a user. When word-checking for the document is desired by the user, the words from the document are retrieved one at time, and checked against entries in an electronic dictionary to determine whether they have a particular meaning that has been designated as potentially inappropriate for use in a text document. The determination is made based on comparing a threshold sensitivity level (which can be controlled by the user) with an appropriateness rating found in one or more status fields associated with the word. If the word in question has a rating higher than the threshold set by the user, an alert is provided to indicate such result.

In another embodiment, multiple status fields are used. The status fields can be used essentially as multiple context filters for assisting an author in reducing the number of potentially inappropriate words as they may be conveyed to multiple intended audiences. The ratings for the words in any of the status fields can have any range of values and are preferably coded at the time the words are placed into the electronic dictionary. They can also be modified by the user, later, if desired.

The present invention is completely integratable with a conventional spell-checking program, so that the spelling of a word can also be analyzed before its meaning is also checked. When a mis-spelled word is found, a user can select from a list of accurately spelled substitute words instead, but such substitute word is also checked to see if has a meaning that is potentially inappropriate for use in a text document.

Another variation of the present invention permits a user to specify a set of documents to

word-check, and to generate an output indicating the results of such check.

In yet another embodiment, the meaning of the words in the document are checked during an idle state of the word processing program, so that the operation of checking the entire document at the user's request at a later time can be reduced in time because it will already have been partially completed.

To further reduce errors, another embodiment of the present invention checks the meanings of words substantially immediate in time after they are input into the document by the user. This can ensure that a potential word problem is in fact brought to the user's attention automatically and without the need for a further command from the user.

The electronic dictionary used in the present invention includes a series of records corresponding to words and their associated status field values. The data for these records are input in electronic form to create a set of words in computer readable form for the dictionary, along with status fields associated for each of such words. Again, as mentioned above, the status fields indicate whether such word has a meaning that is potentially inappropriate for use in a particular context. As the dictionary is constituted, any number of status fields can be used to correspond to different sensitivity ratings for different target audiences.

The present invention can be included within a word checking software module that is itself embodied and transferred in computer readable form, such as a floppy disk, a hard disk, a CD-ROM, a magnetic tape, or a non-volatile semiconductor memory. In this way, a new type of computer system is effectuated which permits an author to perform a word checking operation on an electronic text document generated by a conventional word processing program running on such system.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a simplified block diagram of a word processing system embodying the teachings of the present invention;

FIG. 2 is a flow chart illustrating the operation of a document word checking tool implemented in accordance with the teachings of the present invention;

FIG. 3 is a flow chart illustrating a variation of the present invention adapted for checking words in a number of electronic documents specified by a user.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 illustrates a physical implementation of a preferred embodiment of a system employing the present invention. A user can interact with a word processing program 10 loaded in a system memory of a conventional computing system, such as a personal computer. Such programs typically include a spell checking routine or module 20, broken out visually in the present figure for clarification. The inventive routine of the present invention is also illustrated as word checker routine or module 30.

Both spell checking routine 20 and word checker routine 30 have access to and can store/retrieve entries from a standard electronic dictionary 40, which, again, is well-known in the art. It is understood, of course that spell checking routine 20 and word checker routine 30 may be embedded as one software module of program 10, or alternatively, may be constituted as separate programs that interacts with program 10 and each other. Those skilled in the art will appreciate that a number of separate modules (i.e., for controlling printing, document loading, etc.) of program 20 are not shown, but they are not material to the teachings of the present invention. A document 40 is also shown, and this item can be generated and controlled by a user using word processing program 10 in a conventional manner well-known in the art.

Again, while the present illustration depicts the various routines, documents and dictionaries as separate entities, it is understood that this is a simplified description intended to convey the key concepts of the present invention. During normal operation of word processing program 20 these various entities are typically loaded from a non-volatile memory storage device (such as a magnetic hard disk) and then coexist in a physical and logical sense within the same system memory.

A flowchart of the operation of a preferred embodiment of the present invention is depicted in Fig. 2. When word checker routine 30 is invoked at step 210, it begins to retrieve and analyse words from document 10 in a manner well-known in the art from similar techniques used in conventional spell-checkers. In one variation spell checker routine 20 and word checker routine 30 are "integrated" in the sense that they are invoked together and inter-operate with each other. In this variation, the word from the document is first spell-checked in the manner known in the prior art. For example, if the word is not found in electronic dictionary 50 at step 220, spell

checker routine 20 is invoked at 225. Again, using conventional techniques, a set of suitable alternative words are presented to a user at step 230 as replacements for the unidentified word.

At this point the method of the present invention is not different in any material fashion from prior art spelling programs. At step 235, however, a substantial difference is found in the fact that the present invention does not blindly permit the user to select one of the alternatives presented at step 230. As mentioned above, there is a non-insignificant chance of error presented when large lists of words are presented to users during spell-checking routines. It is altogether too easy to select the wrong word, and worse yet, a very inappropriate word. For this reason, at step 235, the word selected by the user is also checked to see if it is flagged as potentially context restricted. In this manner, errors are further reduced, and an additional level of accuracy is achieved.

In one implementation the information concerning a rating of the restricted status for the word can be stored in an electronic field associated with a record for such word in a dictionary database, as shown in the breakout of the diagram for dictionary 50. Each entry 51 in dictionary 50 includes a word and one or more associated status fields (SF_1, SF_2 .... SF_n), which, in its simplest form, can be a single bit field that is either set or not set, depending on whether the word has been previously designated as potentially inappropriate. This status bit can be set either during the creation of dictionary 40, or at the request of a user later on, much in the same way new words can be added to auxiliary or supplemental dictionaries used in conventional spell-checking programs.

In another embodiment, status field SF_1 can be allocated sufficient coding bits so that it may have any one of N possible values, where N represents a rating indicating a relative ranking of inappropriateness. This feature allows a degree of grading the words of a vocabulary in shades of grey so to speak, and permits more precise control by the user of the level of inappropriateness that can be tolerated within any particular document. For example, using a scale from 1-10, words that are known and commonly used in a vulgar or offensive fashion can be given a 10 value rating, while words that are commonly understood in only harmless contexts can be given a 1 rating. Other words that are not as fixed in meaning or easily classifiable can be given value ratings in between this range, again, depending on their common usage within a

particular target audience. Associated status fields SF_1, SF_2, etc., can be used to generate different and unique sets of inappropriate words for different intended recipient groups. While only three status fields are shown to simplify the present discussion, it is understood that any number may be used in connection with an electronic dictionary. For instance, the ratings found

5 in field SF_1 can be based on word meanings for a typical U.S. based English speaking audience, while SF_2 might be used to indicate the rating for the same word for a different target audience (i.e., a different language speaking group, a different geographic group within the same country, or an audience with specific sensitivities to certain types of words). The ratings for status fields SF_1, SF_2, SF_3 may be derived from survey results, from polling the intended audience

10 populations, from analyzing other published literature materials for such intended groups, from organizations specializing in advertising and marketing, etc.

One advantage of the present invention over the prior art lies in the fact that the ratings of dictionary words 41 can be pre-programmed, instead of requiring a user to inspect each entry and designate the status manually. It is expected that such ratings could be generated by persons

15 skilled in the art of contemporary language usage, or persons having particular knowledge or understanding of terminology used in specific fields, or by specific target audience groups, using some of the reference materials (e.g. surveys and the like) described immediately above. The words and associated ratings can be put into computer readable form at the time of the creation of the dictionary by the vendor of word processing program 10, or by a supplier of dictionary 50

20 using a conventional database structure with accessible records or the like.

It is equally feasible, of course, that an entirely separate electronic dictionary 50' may be designated instead for potentially context restricted words. In this kind of approach step 235 merely checks such separate dictionary 50' to see if the word has been included in the class of potentially inappropriate words. In any event, a number of implementations may be employed

25 for designating potentially offensive words and the present invention is not limited to any of the examples shown herein.

In the event the present invention is not embodied in a routine that runs concurrently with spell checker routine 20, it is apparent that steps 220, 235 and 230 would not occur. In other words, in a stand-alone implementation where word checker routine 30 is invoked as another

typical word processing tool within document 40, the present routine progresses directly from step 215 to step 235 where the word is checked. The key aspect of the present invention lies in the fact that the meaning or substance of words, not simply the spelling of such words, are determined and verified. In a preferred embodiment, a user of word processing program 10 is

5 able to control both: (1) the range of status fields SF_1, SF_2, etc. to be checked, as well as (2) a threshold level value for such field that should be used in determining whether a particular word should be flagged. These control mechanisms for the user can take the form of menu choices implemented in well-known fashion in typical contemporary spell-checking programs. In this manner, a particular user document 40 can be subjected to a variety of language "filters" and

10 with varying levels of sensitivity to provide additional functionality and benefits. For example, some U.S. companies doing business in foreign countries nevertheless communicate and advertise in English to the local population, because of the ever increasing English fluency of such countries. Documents intended for such audiences can be subjected to filtering not only for English words that are deemed inappropriate by U.S. citizens, but also which have a negative

15 meaning when transliterated into the language of the country in question. Other users may find it useful to designate one status field simply as a filter for those words that they know are prone to over-use or misuse to increase their writing clarity and proficiency. Accordingly, a user of program 10 can decide to utilize any one or more of such filters in connection with the word checking of document 40, and the selection of such filters can be accomplished in any one of

20 several known ways (i.e., highlighting desired filters presented in the form of a list, specifying them by name, etc.) In addition, the user can also determine (if desired) the threshold level of sensitivity to be used during the checking of words in document 40. In other words, when a particular status field SF_1 can have a value ranging from 1 to 10, the user can specifically indicate that only words having a status field value in excess of 8 should be considered as potentially

25 inappropriate.

In one sense, the present invention behaves as a superior spell-checker, because it catches even correctly spelled words that are nonetheless incorrect (from the user's intent perspective) because they are based on other words inadvertently mis-spelled originally by the user. In other words, the user had a word with spelling "xyzzy" in mind, but this word was inadvertently input

as "xyyzy." If "xyyzy" (the transformed embodiment of "xyzzy") is nevertheless a word in a spell-checking dictionary, the prior art techniques will never detect this mistake as a true error, even though it is undesirable from the user's perspective, and perhaps worse, may lead to significant embarrassment if undetected. By permitting a user to designate sets of words that

5 should be screened (even if correctly spelled) the present invention affords a significantly higher level of confidence to the user that documents will be generated error and embarrassment free. This kind of tool is especially helpful because of the fact that electronic communications occur in rapid fashion, and dissemination of electronic documents can take place with little chance or opportunity for correcting mistakes.

10 In any event, should a match occur for the word in question indicating that it falls within the parameters of the user's specification for what should be flagged as an inappropriate word, an alert is given to the user at step 240. The alert can take the form of highlighting the word in the text of the document with an accompanying warning that can be either visual, audible or both. The alert can also indicate the identity of the filter that was triggered by the word when more

15 than one status field is used during the word checking process. Again, the precise implementation of the warning is not critical, and any one of many known methods in the art can be used.

At this point, the user can decide at step 245 whether the word is truly inappropriate, and if so, the user can provide a substitute word, or override the program to keep the word as is. The

20 substitute word can be provided directly by the user, or a set of suitable alternatives can be presented in the same way conventional spell checking program 20 provides users with such lists. Again, this substitute selection is nevertheless also inspected and verified for its appropriateness by virtue of the fact that the routine branches back to setp 220. In this manner, the potential for erroneous inclusion of offensive or inappropriate language is further minimized.

25 In the event the user decides to stick with the word, an option can be presented to the user at step 250 for reducing the value of the status field for the word so that it will not be identified as a potentially inappropriate word during a subsequent check (unless a lower threshold is used of course). This might be desirable, for example, in certain fields of use where ostensibly inappropriate words may be nevertheless otherwise acceptable for use in common

communications. At step 255, therefore, a user can modify the status of the word in dictionary 50 or 50' as the case may be.

Those skilled in the art will appreciate that the present invention can be used in a number of environments where documents are electronically drafted and have electronic text, including with spreadsheet programs, database programs, e-mail programs, etc. Many of these programs have spell-checking capabilities built in, and the present invention can piggy-back directly on such capability.

Moreover the present invention can be used for batch inspection and verification of electronic documents, as shown in Fig. 3. Instead of working directly with an open document 40, for example, an electronic file to be word checked can instead be specified at step 305 by a user. This type of capability is common in word-processing programs 10 today, and permits a user to select a number of files that are to to undergo a particular operation without opening them. For example, from the FILE OPEN pulldown option in WORDPERFECT, a print operation can be effectuated on a user specified list of files. In this same way, the present invention as embodied in a word checker routine 30 can operate on a number of files at shown at step 310. As each word is parsed at step 315, an optional spell checking routine 320 first determines if there is mis-spelling of such word, and, if so, tags the word as such at step 325. If the word is otherwise identifiable because it is in dictionary 40 or alternate dictionary 40', it is context checked at step 330 in the manner described above and with the same degree of available control by the user. Each word identified as potentially inappropriate is flagged and tagged at step 335 before the routine returns to process the next word. At the end of the file word checking operation, a list of mis-spelled words and identified potentially misappropriate words is generated for the user's review. This list can be displayed visually, generated as a text file, etc. so the user can determine whether there are potential problems in disseminating such electronic files, and, take corrective action if necessary.

It will be apparent to those skilled in the art that the present invention can be implemented using any one of many known programming languages such as C, C++, Pascal, etc. The details of the specific implementation of the present word checker will vary depending on the programming language used to embody the above principles. Furthermore, while the present

discussion has revolved around IBM compatible machines it is equally clear that the present invention is not limited to such environments and can be used with Apple compatible machines, or for that matter with any machine that includes a word processor, including personal digital assistants and similar portable computing devices.

5   Yet another variation of the present invention makes use of a concept disclosed in the Mogilevsky reference discussed above. In this manifestation, spell checking routine 20 and word checker routine 30 (whether integrated or standalone) can be implemented in a well-known fashion that improves performance by having them operate while there is no interaction going on between the user and word processing program 10.   In other words, the routine can take

10   advantage of otherwise idle time by checking the document and other open documents if the user is not actively engaged in an operation requiring immediate attention by word processing program 20. It is apparent that such variations of the present invention could be beneficial in a number of environments.

         Another useful variation of the present invention can be implemented to take advantage

15   of another well-known concept in the art, and that is the use of "dynamic" text checking. For example, the Travis reference above explains how words can be spell-checked on the fly, i.e., as the user is typing in many conventional word processing programs. This feature permits a user to enter a word, and then have it checked while he or she is still typing, and while their attention is still focused on the document. The spell checking routine 20 automatically substitutes the

20   closest choice it finds for commonly misspelled words; for example, the type word "teh" is changed rapidly to "the" while the user is perhaps still entering text. In a similar vein, a dynamic word-checking feature can be implemented, and it will be apparent to those skilled in the art that this approach is merely a variation of the procedure described in Fig. 2, except that the words retrieved at step 215, are fetched in a background task which is running even while the user is

25   engaged in normal text entry, editing, etc. From the user's perspective, the word-checker routine 30 merely appears as an add-on verification tool feature to spell-checker 20, with additional functionality and benefits for reducing document errors. To minimize errors, the result of the word-check is communicated as quickly as possible to the user, subject to system performance limitations of course. In any event, with typical computing devices it is expected that such result

can be communicated before the user has finished completing data entry of another word that must be checked as well. In some application environments it may be desirable to disable further data input once it has been determined that a potentially inappropriate word has just been entered.

One environment where the dynamic variation is especially useful in e-mail systems where people rarely spell-check a text message after it is composed. Accordingly, the ability to identify and alert users automatically of potential errors is particularly helpful in this area.

In a general sense the present invention can be seen as a useful tool for not only reducing unintentional errors in electronic text documents, but also some intentional errors that are not necessarily understood or appreciated by the user of a word processing program 20. In other words, a word input by a user may be classified by in an number of ways including: (1) an intentional selection that is appropriate; (2) an intentional selection that is inappropriate; (3) an unintentional selection that is inappropriate; or (4) an unintentional selection that is appropriate (in the sense that it is perhaps non-offensive even if it is inapposite for the context). Of these classifications, it is clear that the first category (1) do not require any remedial action. It is equally clear that the category (4) mistakes are perhaps undesirable, but are not easily identifiable, and the computational complexity involved in doing so may not be worthwhile. For example, a sentence that reads "I gave my him jacket" instead of "I gave him my jacket" is not accurate but is not offensive.

The present invention, however, is a simple, fast and cost-effective tool that can be used to easily identify the category (2) and (3) errors above. For the category (3) items, it is a rather simple matter as described above to identify and classify entries in an electronic dictionary with varying status field values reflecting their common usage in a particular context. Any number of potentially offensive, crude, vulgar, obscene or inappropriate words are included in an electronic dictionary for the sake of completeness (and for ease of integration from text to electronic form) but it is rarely the case that they are desired to be used in communication and they can be identified by setting the associated status field to a high value. The category (2) items are somewhat more subtle, but it is apparent that some words, even if consciously selected, may nevertheless be inappropriate because of a number of cultural considerations, or simply because

they are generally misused by the general population of authors. As an example, a considerable amount of attention has been focussed recently in the U.S. on eliminating gender specific vocabulary except where absolutely necessary. A business entity attempting to sell products or services to a primarily female based clientele may benefit from a word checking tool that is sensitive to potential gender issues raised by language found in documents intended to be communicated to such clientele to reduce the possibility of an mis-communication. Many ethnic groups have particular words or phrases that are considered inappropriate or offensive by them, even if they otherwise understood as inoffensive by other groups. For example, Chevrolet automobiles designated "NOVA" did not sell well in Latin American countries, because the term as translated into Spanish means "does not go." In addition, many foreigners attempting to write in English often confuse homonyms and substitute the wrong word choice (for example, weather and whether). Similar examples from other fields will be apparent to those skilled in the art. For any such areas, it would be an easy task for a person skilled in the field of contemporary language and familiar with such potentially offensive vocabulary in such specific area to flag such entries in electronic dictionary 50 by using one of the associated status fields (SF_1, SF_2, SF_n, etc.), and/or to assemble and create a separate customized electronic dictionary of words that potentially implicate inappropriate language for a particular audience. These dictionaries could supplement traditional electronic dictionary 50 and be invoked as needed by a user of word processing program 10, so that any one or more of a number of word checking verifications or document filtrations could be performed depending on the target audience intended to recieve such document. Such additional dictionaries, or additional status field values for a particular filter, could be created in a number of ways, including as additional incorporations in the original dictionary 50, or by the vendor or user of computer program 10 modifying dictionary 50 at a later time.

Finally, word processing program 10, spell-checking program 20 and word-checking program 30 described above can be embodied in well-known ways in an article of manufacture such as in traditional computer-readable media commonly used to transport such programs. These can include a floppy disk, tape, hard disk, CD-ROM or equivalent non-volatile storage system. In this format, they can be transported easily and loaded via a host computer into system

memory for execution. Alternatively in smaller, self-contained environments, such as personal digital assistants, the above routines can be implemented as part of a non-volatile storage portion of a stand-alone integrated circuit, or embedded as part of a non-volatile storage structure in an architecture of a typical microprocessor or RISC processor.   The instructions for carrying out such routines can be encoded or implemented in a silicon substrate as is done with other program ROMs, and using conventional manufacturing techniques.

Although the present invention has been described in terms of a preferred embodiment, it will be apparent to those skilled in the art that many alterations and modifications may be made to such embodiments without departing from the teachings of the present invention. Accordingly, it is intended that the all such alterations and modifications be included within the scope and spirit of the invention as defined by the appended claims.

What is claimed is:

1. A method of checking the meaning of a word in an electronic document comprising the steps of:

    retrieving said word to be checked from said document;

    determining whether said word has been inadvertently included in said document and has a particular meaning that has been designated as potentially inappropriate for use in said document.

2. The method of claim 1, further including a step of designating words that have a meaning that is potentially inappropriate by changing a value of a status field for such words in an electronic dictionary.

3. The method of claim 2, wherein the status field for each of the words can have one of N values, where $N > 2$.

4. The method of claim 2, wherein those words that have a potentially inappropriate meaning can be identified without input from a user of such electronic dictionary.

5. The method of claim 2, wherein an identification of potentially inappropriate words can take place at or about the time the electronic dictionary is first generated.

6. The method of claim 1, further including a step of generating an alert indicating that such word is potentially inappropriate.

7. The method of claim 6, further including a step of permitting a user to change the value of the status flag for such word.

8. The method of claim 1, further including a step of verifying the spelling of such word.

9. The method of claim 7, further including a step of generating a list of substitute words in the event such word is mis-spelled, and if a one of the substitute words is selected in lieu of such word, determining whether the substituted word has a meaning that is potentially inappropriate for use in a text document.

10. The method of claim 1, wherein a list of documents is checked, and a list of potentially inappropriate words in such documents is generated.

11. The method of claim 1, wherein said word is checked substantially immediate in time after it is input into said document by a user.

12. The method of claim 1, wherein said word has a first meaning in a first context, and a second meaning in a second context, and further including a step of determining whether said word has a particular meaning that has been designated as potentially inappropriate for use in either of the first or second contexts.

5 13. The method of claim 2, further including a step of specifying a threshold value which the status field must exceed in order for said word to be identified as potentially inappropriate.

14. A method of permitting a user to simultaneously check both the spelling and meaning of words in an electronic document comprising the steps of:

   [a] retrieving a word to be spell checked and word checked from said document; and

   [b] determining whether said word has been spelled correctly; and

   [c] when said word has been spelled incorrectly, presenting a first list of alternative words to said user as replacements for said word, and permitting said user to select a first replacement word for said word; and

   [d] determining whether the meaning of said word or replacement word has been designated as potentially inappropriate for use in a text document; and

   [e] when said word has been designated as potentially inappropriate, presenting a second list of alternative words to said user as replacements for said word, and permitting said user to select a second replacement word for said word.

15. The method of claim 14, further including a step (f): permitting said user to select said word, the first replacement word, or the second replacement word.

16. The method of claim 14, further including a step (f): repeating steps [d] and [e] as necessary so that a word is selected that is not designated as potentially inappropriate, or said user is permitted to select a word by manual override.

17. The method of claim 14, further including a step of identifying those words that have a meaning that is potentially inappropriate by changing a value of a status field for such words in an electronic dictionary.

18. The method of claim 17, wherein those words that have a potentially inappropriate meaning can be identified without input from a user of such electronic dictionary.

19. The method of claim 17, wherein an identification of potentially inappropriate words can take place at or about the time the electronic dictionary is first generated.

20. The method of claim 14, further including a step of generating an alert indicating that such word is potentially inappropriate.

21. The method of claim 14, further including a step of permitting a user to change the value of the status flag for such word.

22.   The method of claim 14, wherein said word is checked substantially immediate in time after it is input into said document by a user.

23.   The method of claim 14, wherein said word has a first meaning in a first context, and a second meaning in a second context, and further including a step of determining whether said word has a particular meaning that has been designated as potentially inappropriate for use in either of the first or second contexts.

24. A method of word checking an electronic document generated by a word processing program under control of a user of said program, said method comprising the steps of:

storing word-checking status information for said document, including a table containing potentially inappropriate words used in said document;

monitoring interaction between said user and said word processing program to identify idle editing periods;

locating potentially inappropriate words in said document during the idle editing periods, and updating the word checking status information in response thereto as needed.

25. The method of claim 24, wherein the table includes information pertaining to the location in said document of any words that are determined to be potentially inappropriate.

26. The method of claim 24, wherein a check of the spelling of such word is also performed.

27. The method of claim 24, wherein said word has a first meaning in a first context, and a second meaning in a second context, and further including a step of determining whether said word has a particular meaning that has been designated as potentially inappropriate for use in either of the first or second contexts.

28. The method of claim 24, further including a step of permitting a user to specify a threshold which must be exceeded in order for said word to be identified as potentially inappropriate.

29. A method of automatically word checking an electronic document as it is generated by a user of a word processing program, comprising the steps of:

   monitoring data input by said user during a data input period that is intended to be included as a word in said document;

   determining whether the word is potentially inappropriate for use in said document;

   when the word is determined to be potentially inappropriate, alerting said user;

   wherein a result of said word checking is communicated to said user with substantially minimal delay after the data input period for the word.

30. The method of claim 29, wherein said result is communicated before said user has completed data input during a subsequent data input period intended for a subsequent word to be included in said document.

31. The method of claim 29, wherein when the word is determined to be potentially inappropriate said user is precluded from inputting additional words in said document until corrective action has been taken for such word.

32. The method of claim 29, wherein a check of the spelling of such word is also performed, and wherein the result of this spelling check is communicated to said user with substantially minimal delay after the data input period for the word.

33. The method of claim 32, further including a step of generating a list of substitute words in the event such word is mis-spelled, and if a one of the substitute words is selected in lieu of such word, determining whether the substituted word has a meaning that is potentially inappropriate for use in a text document.

34. The method of claim 29, wherein said word has a first meaning in a first context, and a second meaning in a second context, and further including a step of determining whether said word has a particular meaning that has been designated as potentially inappropriate for use in either of the first or second contexts.

35. The method of claim 29, further including a step of permitting a user to specify a threshold which must be exceeded in order for said word to be identified as potentially inappropriate.

36. A method of generating an electronic version of a dictionary comprising the steps of:

inputting data in electronic form to create a set of words in computer readable form for said dictionary; and

providing a status field associated for each of such words, which status field indicates whether such word has a meaning that is potentially inappropriate for use in an electronic document.

37. The method of claim 36, wherein the status field is modifiable, and further including a step of modifying the status field in accordance with the meaning of its associated word.

38. The method of claim 36, wherein the status field can be modified to have any one of N possible values, where N >=2, and where N corresponds to a degree of potential inappropriateness for a word associated with such status field.

39. The method of claim 36, wherein each status field is associated with the meaning of such word in a first context, and including a further step of providing at least one additional status field for indicating whether such word has a meaning that is potentially inappropriate for use in a second context.

40.   An electronic system for permitting a user to check the meaning of words in an electronic document, said system including:

a system memory for storing a word checking software module;

a processing device for executing the word checking software module;

wherein the word checking software module is configured such that it can perform the following operations:

(i)   retrieving said words to be checked from said document;

(ii)   determining whether said word has been inadvertently included in said document and has a particular meaning that has been designated as potentially inappropriate for use in said document.

41.   The system of claim 40, further including an electronic dictionary for storing said words, and wherein the word checking software module designates words that have a meaning that is potentially inappropriate by changing a value of a status field for such words.

42.   The system of claim 41, wherein the status field for each of the words can have one of N values, where $N > 2$.

43.   The system of claim 41, wherein those words that have a potentially inappropriate meaning can be identified without input from said user.

44.   The system of claim 41, wherein an identification of potentially inappropriate words can take place at or about the time the electronic dictionary is first generated.

45.   The system of claim 40, wherein the word checking software module is configured such that it can perform the additional operation of generating an alert indicating that such word is potentially inappropriate.

46.   The system of claim 45, wherein the word checking software module is configured such that it can perform the additional operation of permitting said user to change the value of the status flag for such word.

47.   The system of claim 40, wherein the word checking software module is configured such that it can perform the additional operation of verifying the spelling of said words.

48. The system of claim 47, wherein the word checking software module is configured such that it can perform the additional operation of generating a list of substitute words in the event such word is mis-spelled, and if a one of the substitute words is selected in lieu of such word, determining whether the substituted word has a meaning that is potentially inappropriate for use in a text document.

49. The system of claim 40, wherein the word checking software module is configured such that it can perform the additional operation of checking a set of documents, and generating a list of potentially inappropriate words in such documents.

50. The system of claim 40, wherein said word is checked substantially immediate in time after it is input into said document by a user.

51. The system of claim 40, wherein said word has a first meaning in a first context, and a second meaning in a second context, and wherein the word checking software module is configured such that it can perform the additional operation of determining whether said word has a particular meaning that has been designated as potentially inappropriate for use in either of the first or second contexts.

52. The system of claim 40, wherein the word checking software module is configured such that it can perform the additional operation of specifying a threshold value which the status field must exceed in order for said word to be identified as potentially inappropriate.

53.   An article of manufacture comprising:

an electronic dictionary including a set of words and an associated status field for each of the words for indicating a level of potential inappropriateness for such word when used in an electronic text document;

a word checking routine executable by a computing device and for checking whether words in the electronic text document are inadvertently included, and which routine is configured to perform the following operations:

[a] retrieving a word to be word checked from an electronic text document; and

[b] accessing the electronic dictionary to determine whether the level of potential inappropriateness of such word exceeds a threshold value specified for such document; and

wherein the electronic dictionary and word checking routine are embodied in a computer readable media.

54.   The article of claim 53, further including a spell checking routine for determining whether such word has been spelled correctly.

55.   The article of claim 54, wherein the spell checking routine also presents a first list of alternative words as replacements for the word when it is mis-spelled, and permits a first replacement word to be substituted for the word.

56.   The article of claim 55, wherein the word checking routine is also configured to determine whether the meaning of the replacement word exceeds the threshold value for such document.

57.   The article of claim 53, wherein the word checking routine is also configured to permit a user of the routine to change the value of a status field for any words in the electronic dictionary.

58.   The article of claim 53, wherein the word checking routine is also configured to check words substantially immediate in time after they are input into the document by a user.

59. The article of claim 53, wherein the electronic dictionary has a first status field for indicating a level of appropriateness for a word in a first context, and a second status field for indicating a level of appropriateness for such word in a second context, and the word checking routine is configured to check whether any words have a particular meaning that has been designated as potentially inappropriate for use in either of the first or second contexts.

60. The article of claim 53, wherein the computer readable media includes any of the following: a floppy disk, a hard disk, a CD-ROM, a magnetic tape, or a non-volatile semiconductor memory.

61. A system for permitting a user to check the meaning of words in an electronic document, said system including:

a computer readable storage structure for storing a word checking software module, such module being incorporated as part of a word processing program that can be executed by a computer processing device;

wherein the word checking software module is configured such that when it is executed by the computer processing device it can perform the following operations:

 (i) retrieving said words to be checked from said document;

 (ii) determining whether said word is inadvertently included and has a particular meaning that has been designated as potentially inappropriate for use in said document.

62. The system of claim 61, further including an electronic dictionary for storing said words, and wherein the word checking software module designates words that have a meaning that is potentially inappropriate by changing a value of a status field for such words.

63. The system of claim 62, wherein the status field for each of the words can have one of N values, where N > 2.

64. The system of claim 61, wherein the word checking software module is configured such that it can perform the additional operation of generating an alert indicating that such word is potentially inappropriate.

65. The system of claim 61, wherein the word checking software module is configured such that it can perform the additional operation of permitting said user to change the value of the status flag for such word.

66. The system of claim 61, wherein the word checking software module is configured such that it can perform the additional operation of verifying the spelling of said words.

67. The system of claim 66, wherein the word checking software module is configured such that it can perform the additional operation of generating a list of substitute words in the event such word is mis-spelled, and if a one of the substitute words is selected in lieu of such word, determining whether the substituted word has a meaning that is potentially inappropriate for use in a text document.

68. The system of claim 61, wherein the word checking software module is configured such that it can perform the additional operation of checking a set of documents, and generating a list of potentially inappropriate words in such documents.

69. The system of claim 61, wherein said word is checked substantially immediate in time after it is input into said document by a user.

70. The system of claim 61, wherein said word has a first meaning in a first context, and a second meaning in a second context, and wherein the word checking software module is configured such that it can perform the additional operation of determining whether said word has a particular meaning that has been designated as potentially inappropriate for use in either of the first or second contexts.

71. The system of claim 61, wherein the word checking software module is configured such that it can perform the additional operation of specifying a threshold value which the status field must exceed in order for said word to be identified as potentially inappropriate.

72. An electronic dictionary embodied in computer readable form for use in a word
processing program, said dictionary including:

   a set of words represented in computer readable form;

   a status field associated for each of such words, which status field facilitates a
determination of whether such word, when inadvertently included in an electronic
document, has a meaning that is potentially inappropriate for use in such document.

73. The dictionary of claim 72, wherein the status field is modifiable.

74. The dictionary of claim 73, wherein the status field has one of N possible values, where
$N > 2$, and where N corresponds to a degree of potential inappropriateness for a word
associated with such status field.

75. The dictionary of claim 73, wherein each status field is associated with the meaning of
such word in a first context, and including at least one additional status field for
indicating whether such word has a meaning that is potentially inappropriate for use in a
second context.

76. A method of checking the meaning of a word in an electronic document comprising the steps of:

  retrieving said word to be checked from said document;

  determining whether said word has a particular meaning that is likely to be offensive to persons intended to read such text document.

77. The method of claim 76, further including a step of designating words that have a meaning that is likely to be offensive by changing a value of a status field for such words in an electronic dictionary.

78. The method of claim 77, wherein the status field for each of the words can have one of N values, where $N > 2$.

79. The method of claim 76, further including a step of generating an alert indicating that such word is likely to be offensive.

80. The method of claim 76, further including a step of verifying the spelling of such word.

81. The method of claim 80, further including a step of generating a list of substitute words in the event such word is mis-spelled, and if a one of the substitute words is selected in lieu of such word, determining whether the substituted word has a meaning that is likely to be offensive.

82. The method of claim 76, wherein said word is checked substantially immediate in time after it is input into said document by a user.

ABSTRACT OF THE DISCLOSURE

A word processing tool is disclosed for checking the substance and not merely the spelling of words provided by a user. The word checker is capable of identifying potentially inappropriate word choices so that unintentional errors are not introduced into electronic text documents. The word checker can be implemented as a stand-alone procedure, or integrated into a conventional spell-checking program.
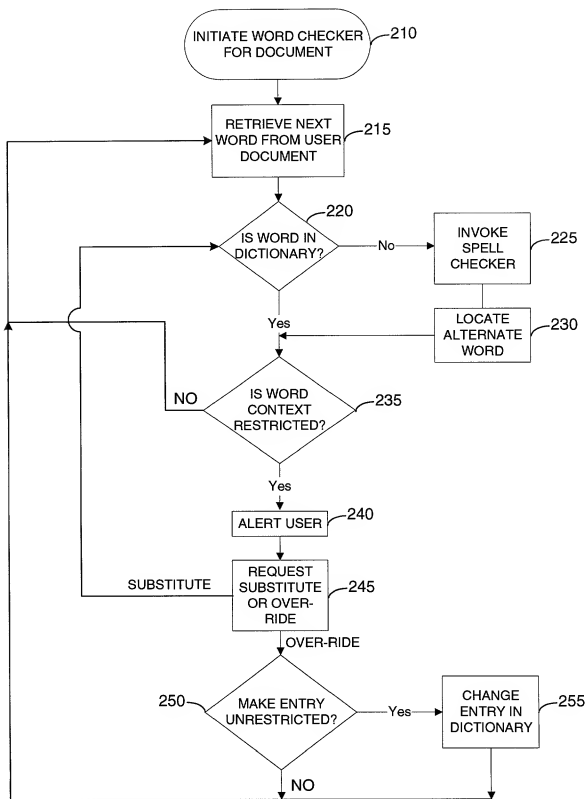
Figure 1

USER DOCUMENT — 40

WORD PROCESSOR — 10

SPELL CHECKER — 20

WORD CHECKER — 30

ELECTRONIC DICTIONARY — 50

WORD	SF$_1$	SF$_2$	SF$_3$	....	SF$_N$
51					

Figure 2

INITIATE WORD CHECKER
FOR DOCUMENT — 210

RETRIEVE NEXT
WORD FROM USER — 215
DOCUMENT

IS WORD IN
DICTIONARY? — 220 — No → INVOKE
SPELL — 225
CHECKER

LOCATE
ALTERNATE — 230
WORD

NO — IS WORD
CONTEXT
RESTRICTED? — 235

Yes

ALERT USER — 240

SUBSTITUTE — REQUEST
SUBSTITUTE
OR OVER- — 245
RIDE

OVER-RIDE

250 — MAKE ENTRY
UNRESTRICTED? — Yes → CHANGE
ENTRY IN — 255
DICTIONARY

NO

Figure 3

SPECIFY FILE — 305

↓

INITIATE WORD CHECKER — 310

↓

PARSE NEXT WORD IN FILE — 315

↓

IS WORD IN DICTIONARY? — 320 →No→ TAG AS MISSPELLED — 325

↓ Yes

IS WORD CONTEXT RESTRICTED? — 330

←NO

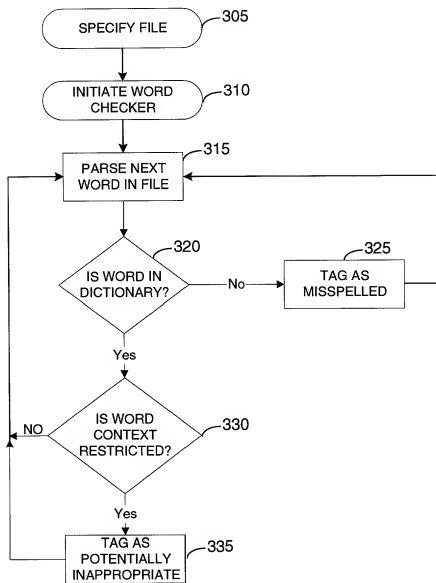↓ Yes

TAG AS POTENTIALLY INAPPROPRIATE — 335

Applicant or Patentee: *John N. Gross*   Attorney's Docket No: JNG-98001
Serial or Patent No.:
Filed: 1/27/98
For: *Word Checking Tool for Word Processing Applications*

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9 (f) and 1.27 (b)) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9 (c) for purposes of paying reduced fees under section 41 (a) and (b) of Title 35, United States Code, to the Patent and Trademark described in

{X} the specification filed herewith
{ } application serial no._____, filed
{ } patent no._____, issued _____.

I have not assigned, granted, conveyed or licensed and am under no obligation or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9 (c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9 (e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

{X} no such person, concern, or organization
{ } persons, concerns, or organizations listed below*

   *Note: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME *John N. Gross*
ADDRESS 47 Big Tree Way Woodside, CA 94062
INDIVIDUAL   SMALL BUSINESS CONCERN   NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28 (b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Full name of inventor: *John N. Gross*

Inventor's signature _____ Date   1/27/98

Applicant or Patentee: _Anthony A. Gross_   Attorney's Docket No: JNG-98001
Serial or Patent No.:
Filed: _1/27/98_
For: _Word Checking Tool for Word Processing Applications_

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{X} the specification filed herewith
{ } application serial no._____, filed
{ } patent no._____, issued _____.

I have not assigned, granted, conveyed or licensed and am under no obligation or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9 (c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9 (e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

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{ } persons, concerns, or organizations listed below*

     *Note: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME _Anthony A. Gross_
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Full name of inventor: _Anthony A. Gross_

Inventor's signature _____ Date _1/27/98_

DECLARATION FOR PATENT APPLICATION
/POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled *Word Checking Tool for Word Processing Applications*, the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: *John N. Gross, Esq.*

Please address all telephone calls to John N. Gross, Attorney at Law at telephone number *(408) 342-1862* address all correspondence to *John N. Gross, Attorney at Law, 10950 N. Blaney Suite B, Cupertino, CA 95014*

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor (given name, family name) *John N. Gross*

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